

**Testimony of**

**Eugene R. Freedman, Esq.  
Policy Counsel**

**National Air Traffic Controllers Association**

**Before the**

**United States Senate  
Special Committee on Aging**

**A Fresh Look At Mandatory Retirements:  
*Do They Still Make Sense?***

**September 14, 2004**

Good morning Chairman Craig, Senator Breaux, and members of the Special Committee on Aging. I want to thank you for the opportunity to testify today on the mandatory retirement age rules and how they apply to our air traffic control system. I am Eugene Freedman, Policy Counsel for the National Air Traffic Controllers Association.

## **Introduction**

The US air traffic control system is the safest and most effective system in the world, but looming staffing shortages threaten its integrity. In the coming years, our air traffic control system will face a succession of retirements and a shortage of qualified Air Traffic Controllers. The consequences of inaction on this issue are dire.

Proponents to raise the mandatory retirement age of Air Traffic Controllers argue that American careers can be prolonged as people live longer and healthier than ever before. While NATCA has considered such an option, clinical and psychological evaluations confirm that extending the career life of Air Traffic Controllers is not an option or a solution. This proposal is fraught with considerable problems that I will address today. Extending the careers of current controllers will not preserve the safety of our skies. We must hire and train thousands of new controllers so that our systems capacity may grow to meet the safety needs of our nation's travelers.

A succession of retirements, with no one to follow, will deprive our system of resources to modernize equipment, redesign airspace and pursue the highest possible standards. Shortages will mean increased delays for travelers and a jeopardized future for America's air traffic control system. Worse, controller shortages will increase operational errors, threatening the safety of the American skies.

## **About NATCA**

NATCA is proud to represent the diverse workforce that keeps our skies safe. Aviation safety depends on experts like the 15,000 Air Traffic Controllers, 1,200 FAA engineers, 600 traffic management coordinators, and thousands of automation specialists that NATCA represents. These federally-employed specialists serve the FAA, Department of Defense, and private sector. Combined, they support field facilities and regional personnel from a range of FAA specialist divisions such as logistics, budget, finance, agency occupational health, nursing, and medical programs.

These men and women have made our system a world leader in aviation, one that the rest of the world strives to attain. While we see opportunities to improve and even criticize our system, the rest of the world sees our system as a goal. Aviation professionals all over the globe look to the United States with admiration. Australia is trying to emulate our airspace, Europe wants to achieve our efficiencies, and Argentina would benefit by modeling our infrastructure. I am proud to represent the world's finest air traffic control employees, and proud of my country for leading the world in air traffic control. However, I am also concerned for the future of our system and the safety of our skies.

Safety is what we do, it is our sacred trust, and NATCA members are the very people who make sure your flight takes off safely and brings you back home. They are committed to ensuring the highest performance of the sophisticated operations of the National Airspace System, but operations like air traffic control, navigation, surveillance, communication, and automation equipment, require an ample, highly trained staff. Unless the Federal Aviation Administration and Congress address this crisis now, we risk compromising the safest, most efficient air traffic control system in the world. No single issue threatens the continued safety of our air traffic control system more than the staffing shortage in front of us right now.

### **Waivers to the Mandatory Retirement Age**

Initial studies on aging and controller performance lead Congress to set restriction on both application and retirement ages as early as 1972. The studies, indicating that job performance declines with age, promptly lead Congress to mandate the removal of controllers from positions requiring the direct separation and control of air traffic at age 56 and prohibit controller applicants older than 31 years-of-age.

Now, more than three decades later, Congress is confronted with a staffing crisis and has directed the FAA to allow age waivers to let controllers work beyond the mandatory retirement age. I urge you to exercise extreme caution in allowing this. Such an allowance is unprecedented in FAA history, and the resulting problems with manpower distribution and job performance will pose serious threats to our current system. We have considered this option thoroughly and reject it as a short-term solution to serious long-term risks. NATCA studies indicate that extending controllers' careers will not be enough to compensate for a huge employment loss. Clinical and psychological studies indicate that high stress levels, health complications and declining cognitive abilities make extending these careers extremely dangerous.

A 1999 NATCA survey provides evidence that the number of controllers wishing to work as Air Traffic Controllers, past the current retirement age, is not enough to offset current shortages. Only 25 percent of controllers participating in the study reported a desire to work longer if waivers were granted. Twenty percent of respondents indicated they will seek FAA employment in positions other than full-time controllers prior to retirement. Finally, a higher percentage of tower controllers plan to work until age 56 than in the TRACON or ARTCC workforce, threatening the balance of human resources across the system.

But even if a later retirement age could compensate for staffing shortages, clinical and psychological studies since the late 1970's indicate the serious risk of extending the mandatory retirement age of controllers.

## **Controller Profession**

Every second that a controller is separating and directing aircraft, he or she has the safety of the flying public in his or her hands. The stress level associated with such responsibility is unparalleled by any other job in the aviation community. *An Information Processing Interpretation of Air Traffic Control Stress*, by Finkleman and Kirschner in 1980, shows the demand of monitoring and processing a rapid flow of information can be a source of significant stress for Air Traffic Controllers. There is no doubt; it takes a special type of person to perform in this type of environment, and the Rose, Jenkins and Hurst study in 1978 defined the common personality traits of such people.

The *Air Traffic Controller Health Change Study*, found controllers to be intelligent, bold, dominant, group-conforming, and somewhat detached individuals who control their anxieties through compulsive activities; the same characteristics that are generally considered descriptors of type-A behavior pattern. Type-A individuals are associated with competitiveness, a need for control, aggressiveness, a strive for achievement, and impatience. They are also associated with increased risks for heart disease, hypertension, and complications ranging from gastrointestinal syndromes to nonspecific viral disorders.

Air Traffic Controllers are not alone in their daily responsibilities, but each individual is a critical element in a system based on teamwork. The teamwork occurs both within and between airspace sectors. In many ways, the team can compensate for differences in performance of team members. However, as with any network, there are limits to the amount some team members can compensate for others before it will cause consequences throughout the system. With the ever-increasing level of air traffic, individual controllers must remain efficient throughout their working careers. Sporadic hiring patterns in the FAA over the last 20 years have resulted in a continuing increase in the average age of air traffic controllers. An increase in the mandatory retirement age will only further increase the average age, placing greater limitations on the ability of the team to meet the demands of the system.

But studies show that health risks, stress levels and declining cognitive abilities as controllers age may limit a controller's ability to share the burden of his duties with his colleagues.

## **Stress and Physical Problems**

Studies since the late seventies have identified health trends among personality types that confront quick and confident decisions with little or no room for error, like those of controllers. These studies indicate people with type-A behavior patterns are predisposed for health complications that should limit the length of a controller's career.

The 1978 controller health study reports hypertension as the most prevalent chronic illness among controllers. Forty-one percent of participants reported incidence of hypertension, about three-times the national average. The study also found high rates of acute gastrointestinal syndromes, nonspecific viral disorders, and upper respiratory tract infections - all of which led to work absenteeism. A similar 1996 study among Canadian controllers, *Survey of Health Problems and Personality in Air Traffic Controllers* by MacLennan and Peebles, also found a strong relation between symptoms of cardiovascular disease and specific components of Type-A behavior patterns. Similarly, the study notes that gastrointestinal disorders could be strongly predicted by behavioral patterns. Both studies noted that these personality variables were strong predictors of headache and vision problems related to a weak immune system function.

Two other studies in the 1980s indicate that controllers may suffer from weakened immune systems later in life. In 1984 Krantz and Manuck reported that people with type-A behavior patterns tend to experience higher levels of sympathetic nervous system arousal, which often leads to a weakened immune system. A 1988 study by Suls and Sanders, found that those with type-A personalities adopt lifestyles with little time for healthful behaviors like regular exercise, nutritious meals, and sufficient sleep causing further detriment to health and immune system functions. Controllers with weak immune systems are likely to miss more days of work, creating an unreliable workforce and adding stress to system resources that are already stretched too thin.

Common physical problems among Air Traffic Controllers develop from prolonged periods of stress and exhaustion. A study of Italian Air Traffic Controllers in 1994 found close correlations between age, years of experience and burnout - defined as both emotional, mental, and physical exhaustion. Doctors Dell'Erba, Venturi, Rizzo, Porcu', and Pancheri found that professional dissatisfaction and work-related stress causes controllers to burnout more quickly. They go on to indicate that non-work stressors did not have a prominent role in the genesis of burnout. Although unpublished, Schroeder's FAA studies from 1991 will confirm these findings. Both would probably agree that a controller's likelihood to "burnout" over time poses serious risks to job performance.

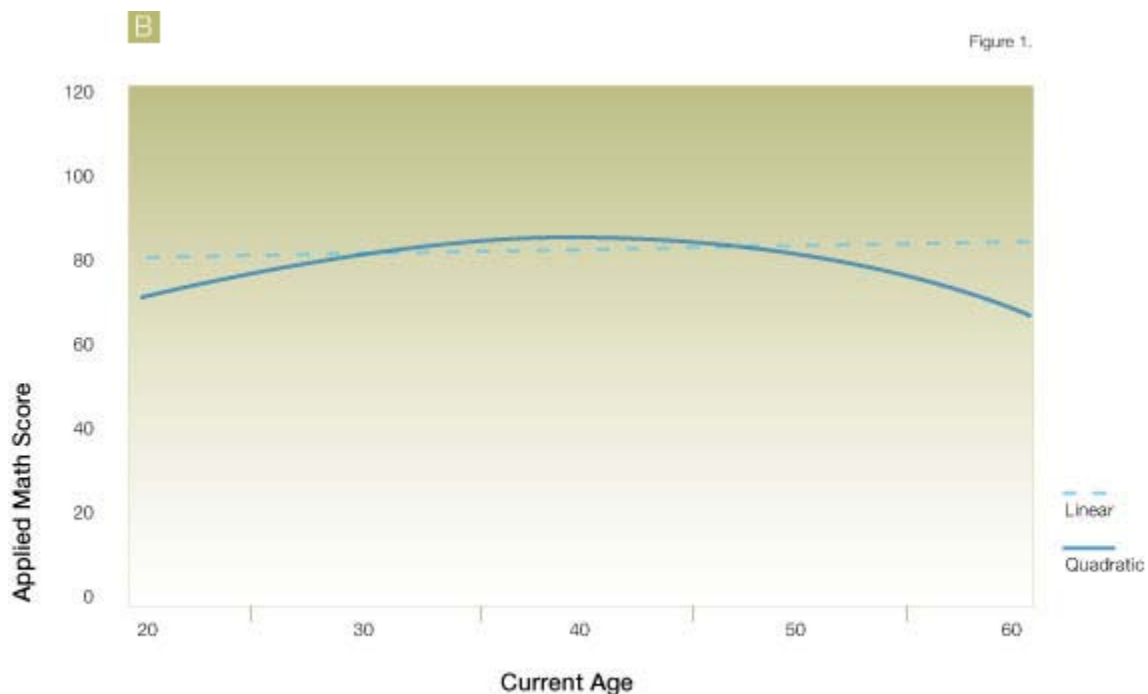
## Age and Cognitive Ability

Not only does age and length of service have an impact on physical and mental health, but it also has an impact on cognitive ability. The FAA conducted a study, published in 1999, that found a negative relationship between Air Traffic Controllers' age and performance on several objective measures of cognitive ability. The study, *Air Traffic Control Specialist Age and Cognitive Test Performance*, authored by Michael Heil for the Civil Aeromedical Institute within FAA, found that older controllers have lower levels of performance on tasks that requiring fluid intelligence. Older participants also showed lower performance on tasks that require high levels of cognitive processing and multitasking. Heil acknowledged that these controllers did not lack knowledge of operations but lacked the raw ability, or willingness to follow specific procedures.

The FAA's 1999 study provides valuable data you will find below. The results of the individual studies show a dramatic drop in performance, based on the age of controllers. Although the below tests are not controller-specific scenarios, they are based upon air traffic scenarios to measure cognitive abilities. The results of each test are easily identified and project the serious consequences of extending the careers of Air Traffic Controllers. The benchmark for a decline in cognitive abilities, across the board, is 45 years of age. Be aware that extending the retirement age will mean employing Air Traffic Controllers whose abilities have been declining for more than 11 years.

For example, a sample math question contained on the test was: *A plane has flown for 3 hours with a ground speed of 210 knots. How far did the plane travel?*

Performance on the math test improved through age 40 and leveled out until age 45, where scores began to decline.



The angles test had two types of questions. It either showed participants an angle and asked them to identify it in degrees, or gave participants a measure in degrees and asked them to match it to a drawing among four choices. Again, performance improved or remained steady until approximately age 45, when performance began to decline.

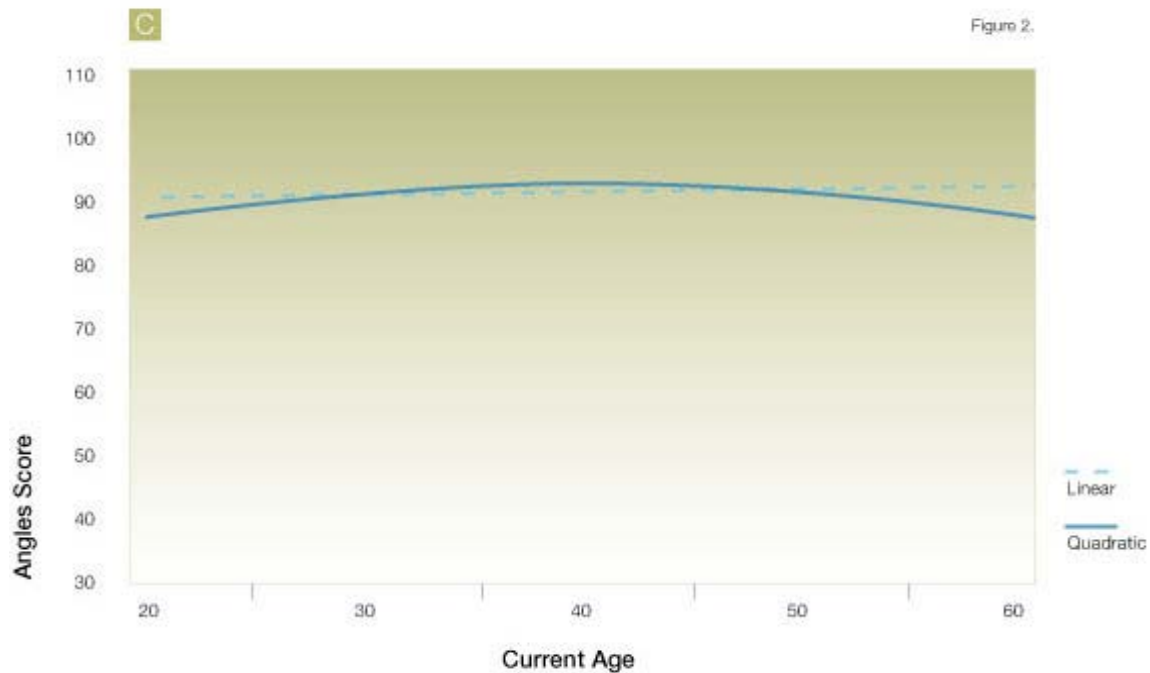


Figure 2. Regression of Current Age on Angles Score

In the Letter Factory tests, controllers used a computer program simulating a factory producing letters (A,B,C & D) in different colors. The controllers were required to pick up letters in various colors, order new boxes when supplies became low, and call quality control when there were defective letters on the screen. On measures of both situational awareness and planning and thinking ahead, declining performance was directly linked to age, with a more precipitous decline after age 45.

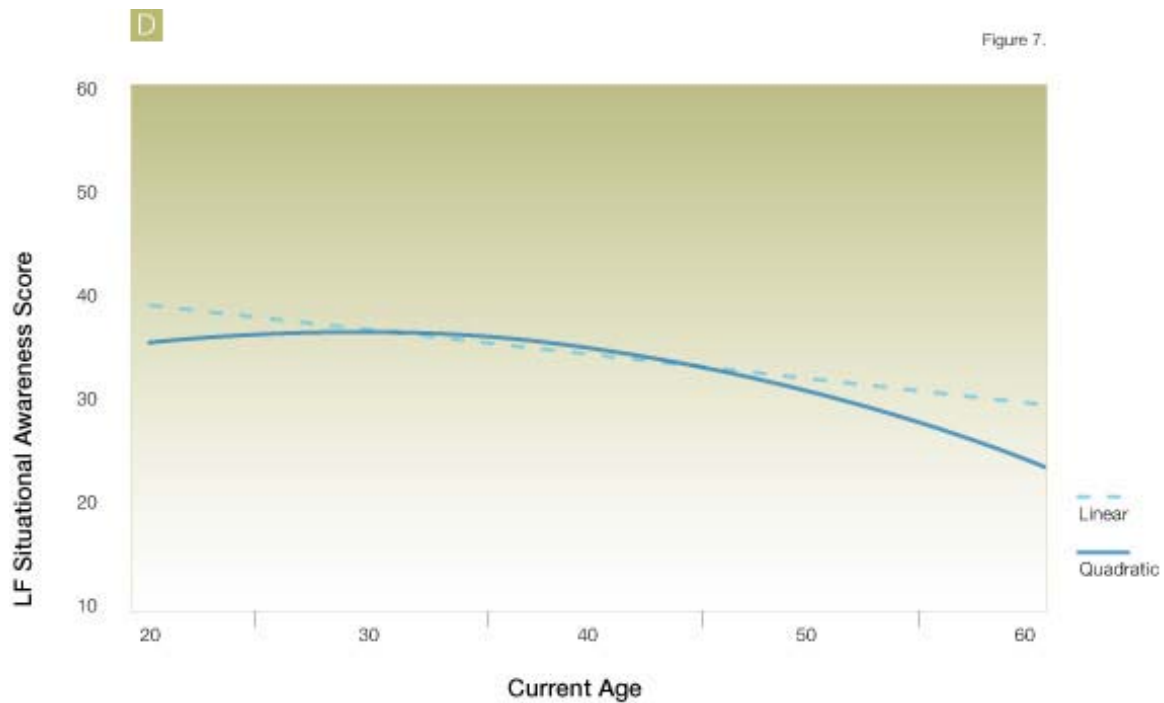


Figure 7. Regression of Current Age on LF Situational Awareness Score

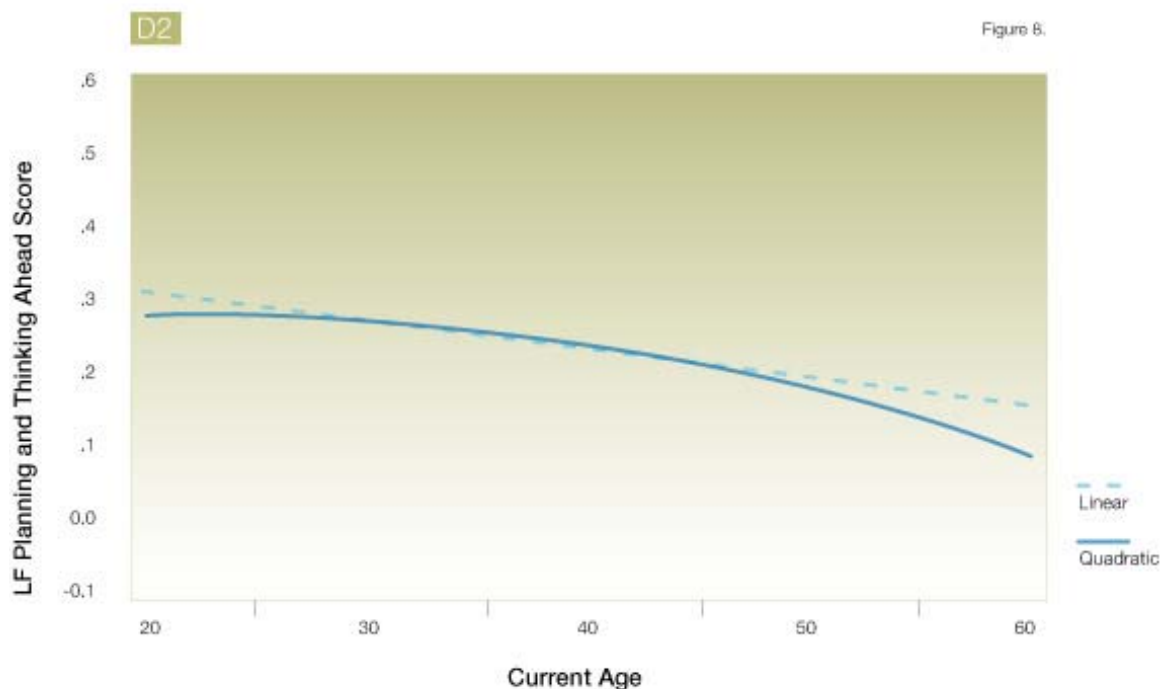


Figure 8. Regression of Current Age on LF Planning and Thinking Ahead



In the Dial reading test, where controllers were asked to read certain dials on an instrument panel and choose among five responses, again there is a decline beginning at age 45.

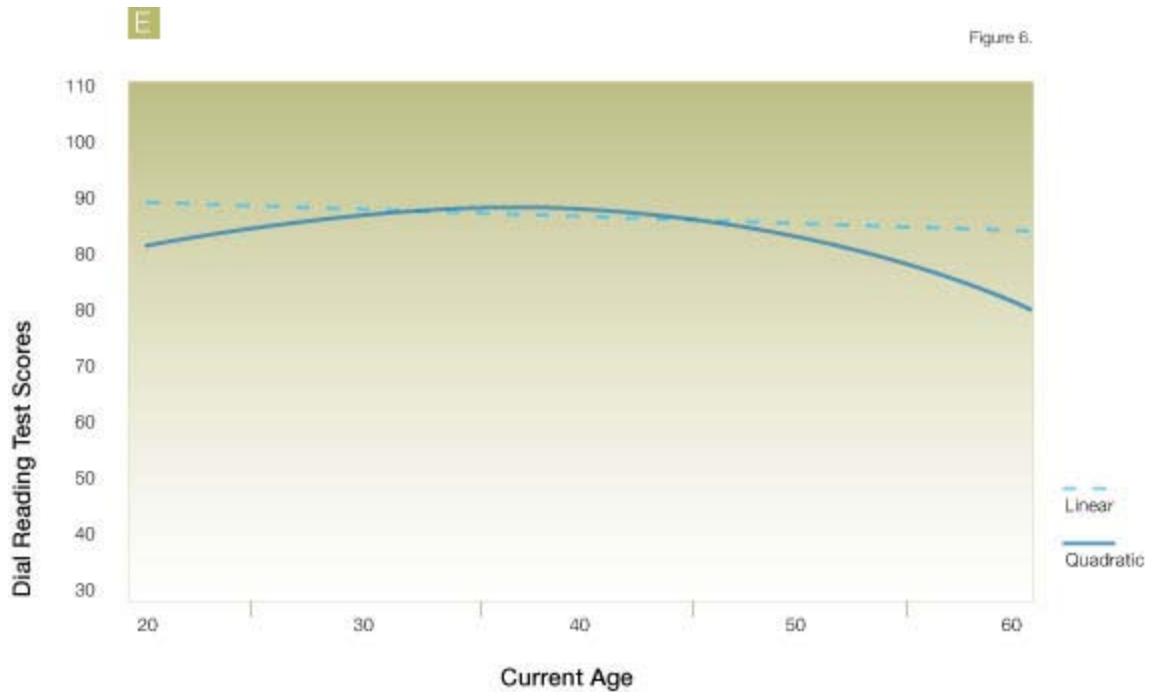


Figure 5. Regression of Current Age on Dial Reading Test Score

When controllers were asked to follow analogy rules and select words or visual symbols to complete analogies controllers' performance declined substantially beginning at age 45.

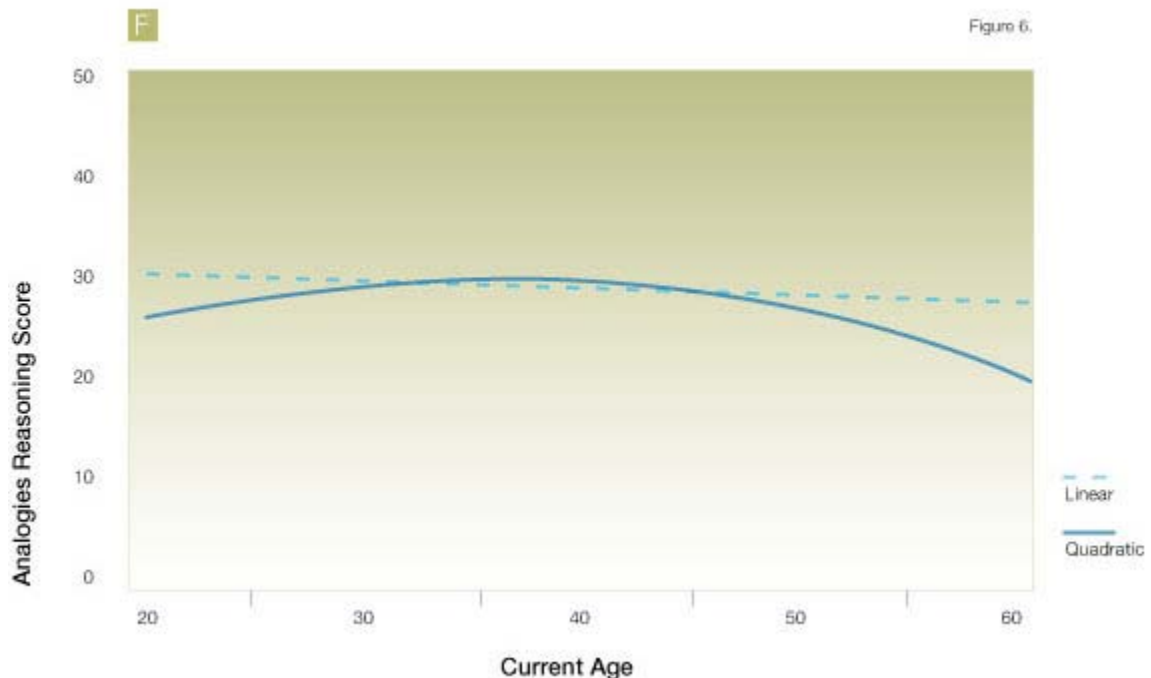


Figure 5. Regression of Current Age on Analogies Reasoning Score

Testing of Air Traffic Efficiency and AT Safety, along with the ability to scan a screen and track objects, also resulted in linear declines based upon age.

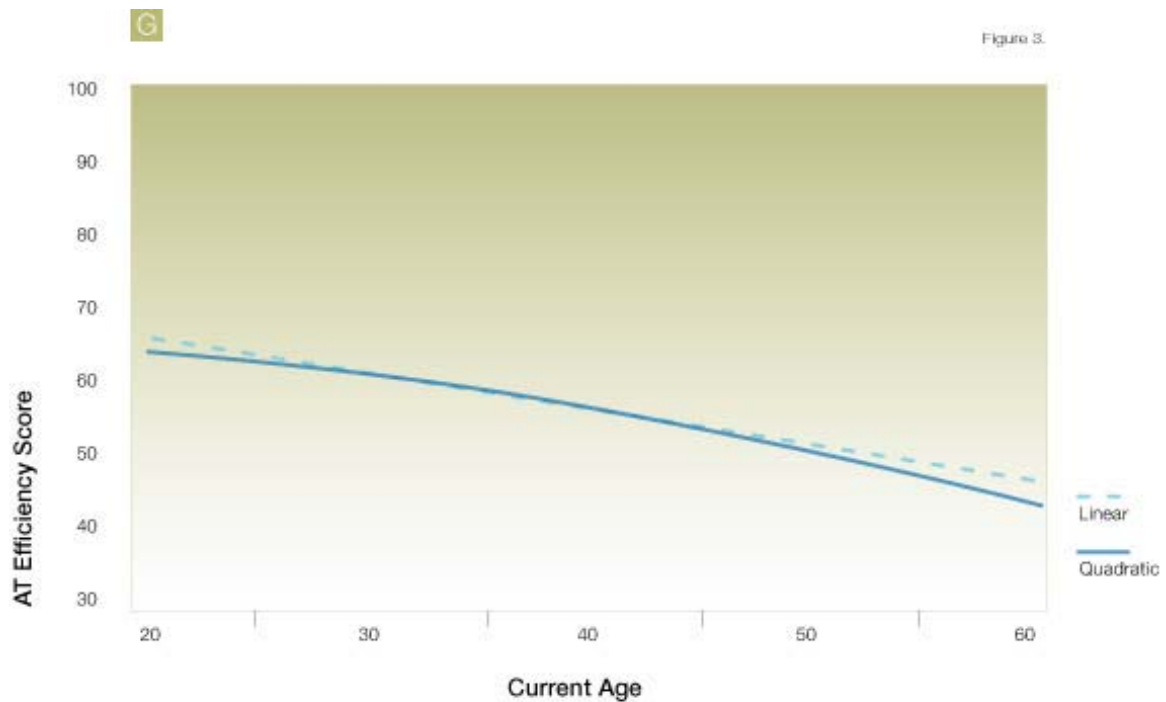


Figure 3. Regression of Current Age on AT Efficiency Score

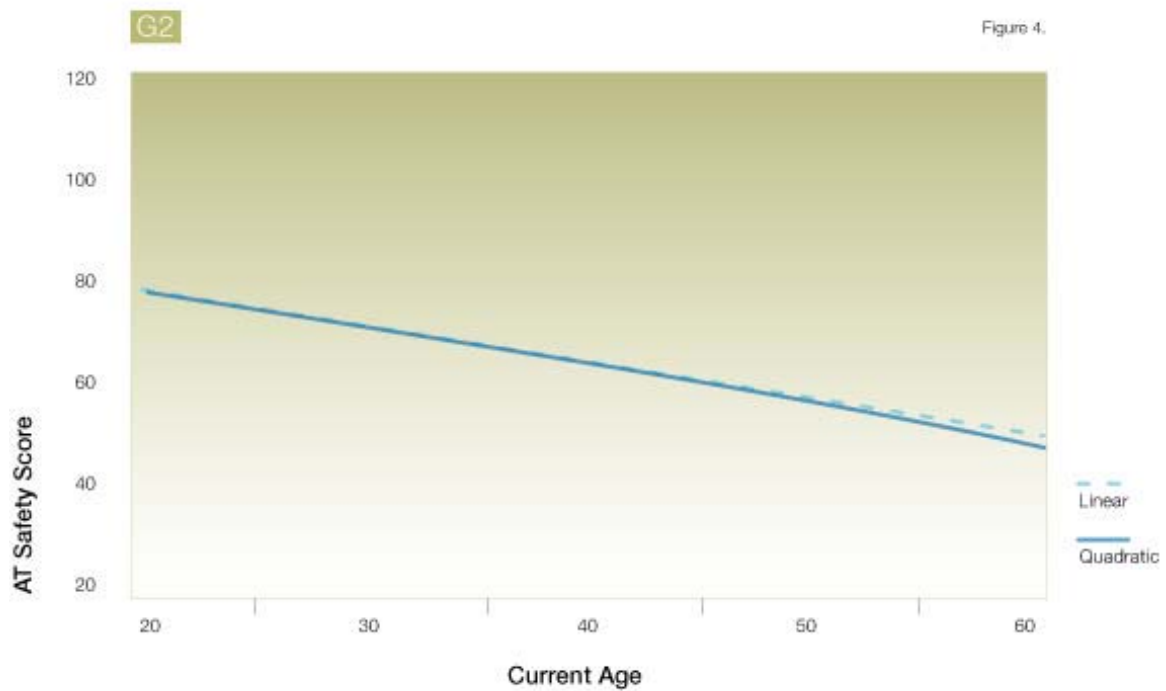
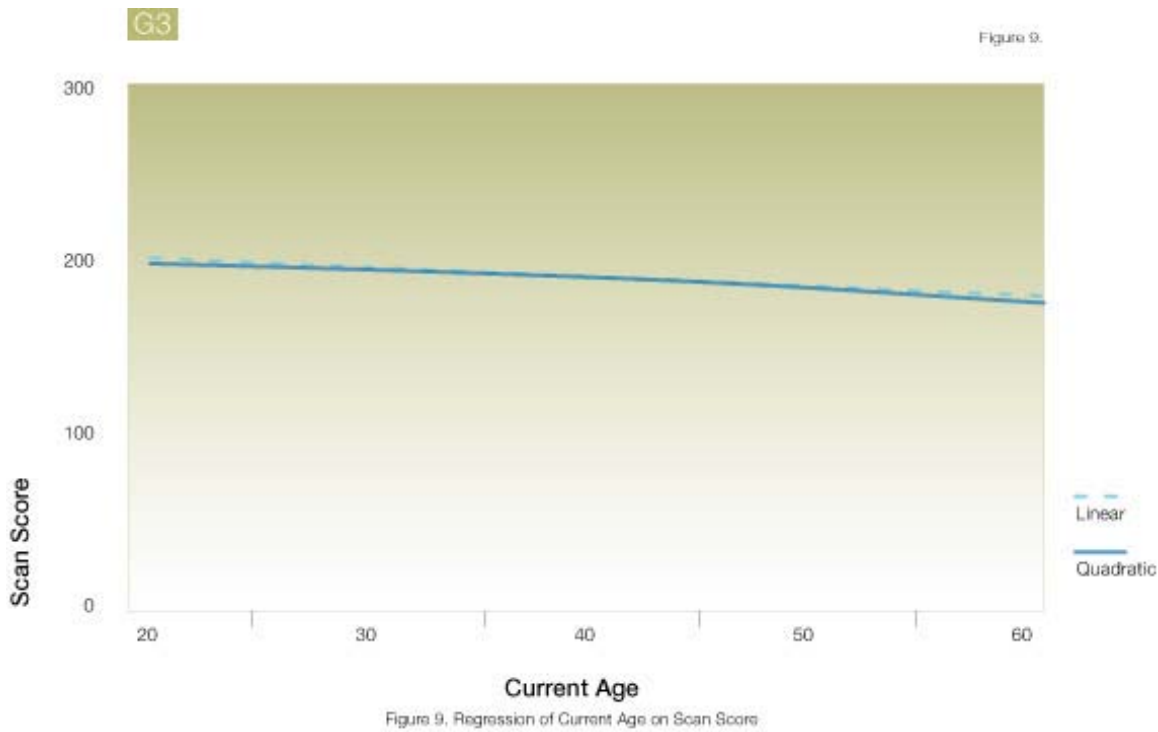


Figure 4. Regression of Current Age on AT Safety Score



I think you'll find that the above results warn against extending the retirement age of controllers. As cognitive abilities decline with age, so does individual job performance. In air traffic control, that drop could echo throughout the entire air traffic system.

### **Age and Job Performance**

Researchers have consistently found a negative relationship between controller age and performance. Initial studies and recent studies alike, identified this relationship in a variety of air traffic control functions. The mandates set by Congress in 1972 remain current with the findings of the most recent studies.

Studies dating back as far as 1968 found a negative relationship between age and performance. The most relevant and recent study in 1999, by Michael Heil for the Civil Aeromedical Institute within FAA, reaffirms these initial findings. In *An Investigation of the Relationship between Chronological Age and Indicators of Job Performance for Incumbent Air Traffic Control Specialists* the results show that the performance and controller capability concerns of today are the same concerns Congress faced thirty years ago. If anything, the 1999 study, has elaborated on how age will affect job performance. The study provides an assessment rating of controller job performance by peers and supervisors, but went on to include a completely objective, computer-based performance measure as well.

For the peer and supervisor ratings, the table shows that performance increased through age 40, where performance leveled out, and scores begin to decrease at approximately age 45.

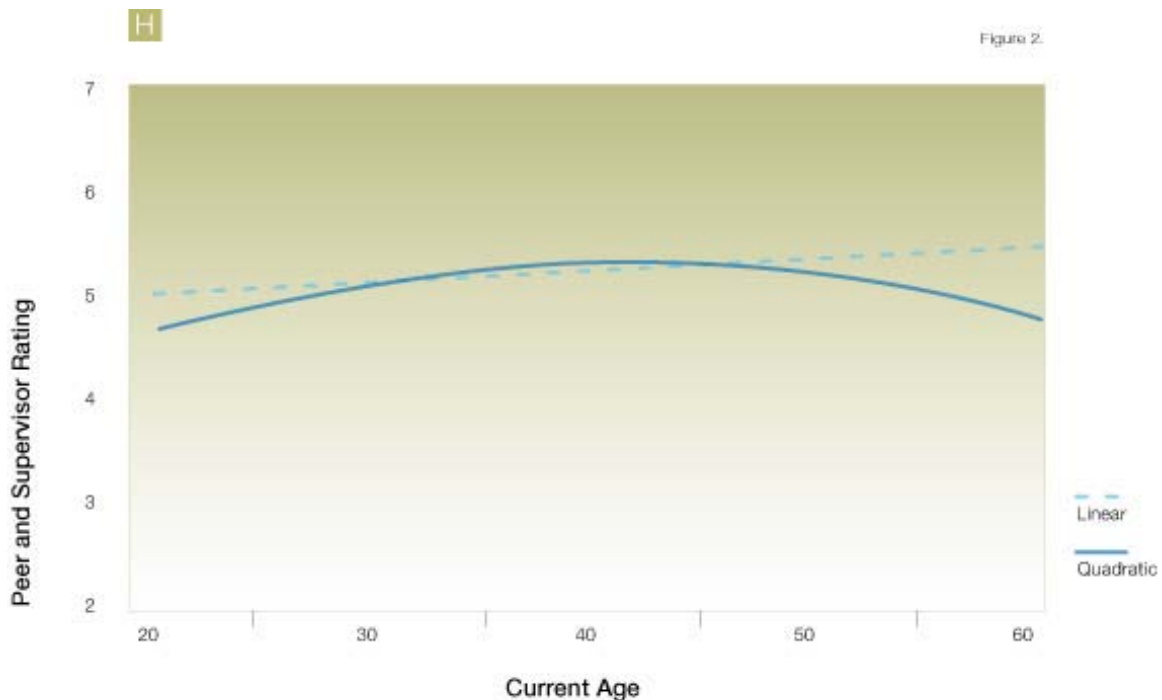


Figure 2. Regression of Current Age on Peer Supervisor Ratings

On the computer-based performance model, controllers who were age 50 and older scored significantly lower than controllers of other age groups. Again, scores gradually increased with age until peaking for controllers in the 38-43 age range.

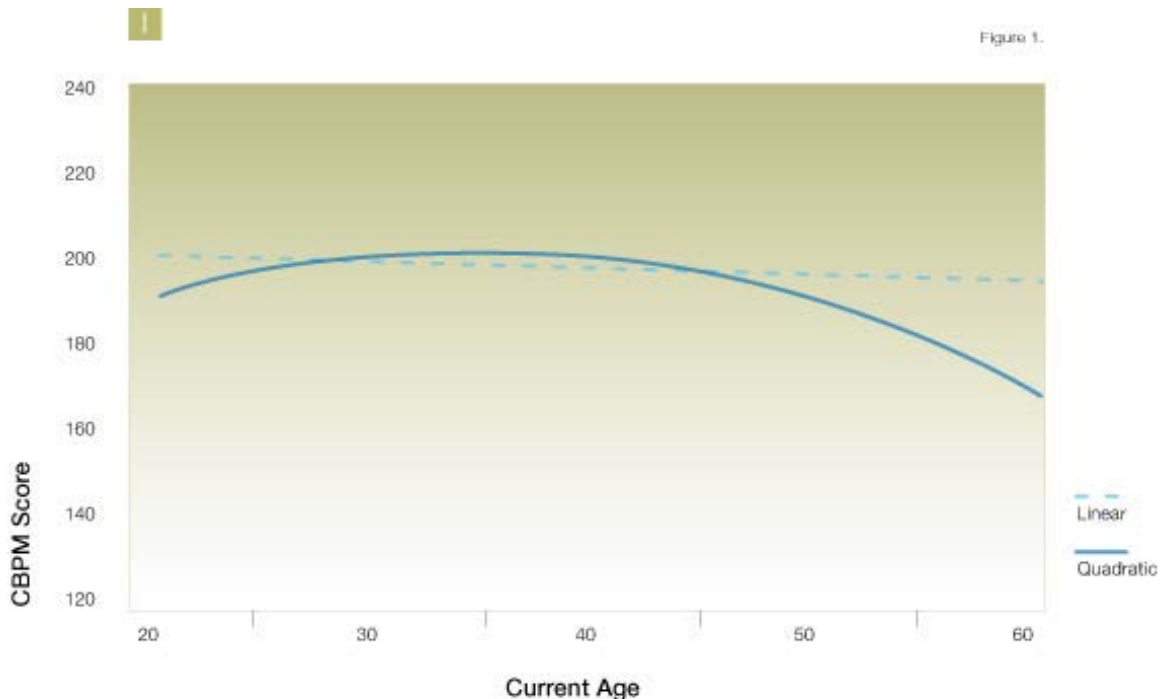


Figure 1. Regression of Current Age on CBPM

While the regression line is telling, the mean score by age group is even more disturbing.

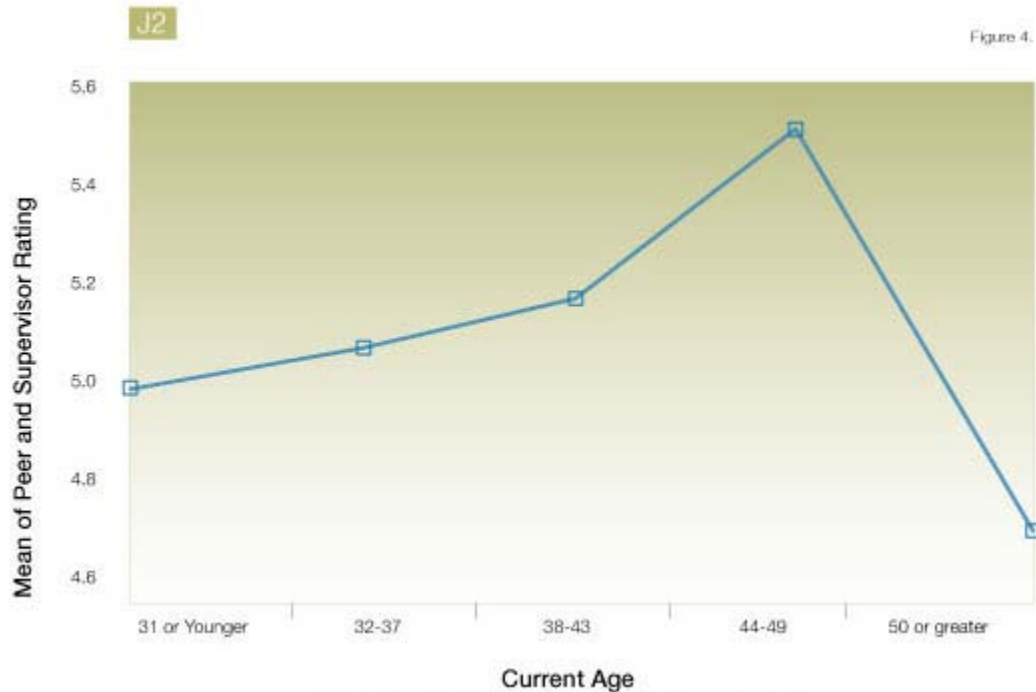


Figure 4. Mean Peer and Supervisor Ratings for Current Age Group

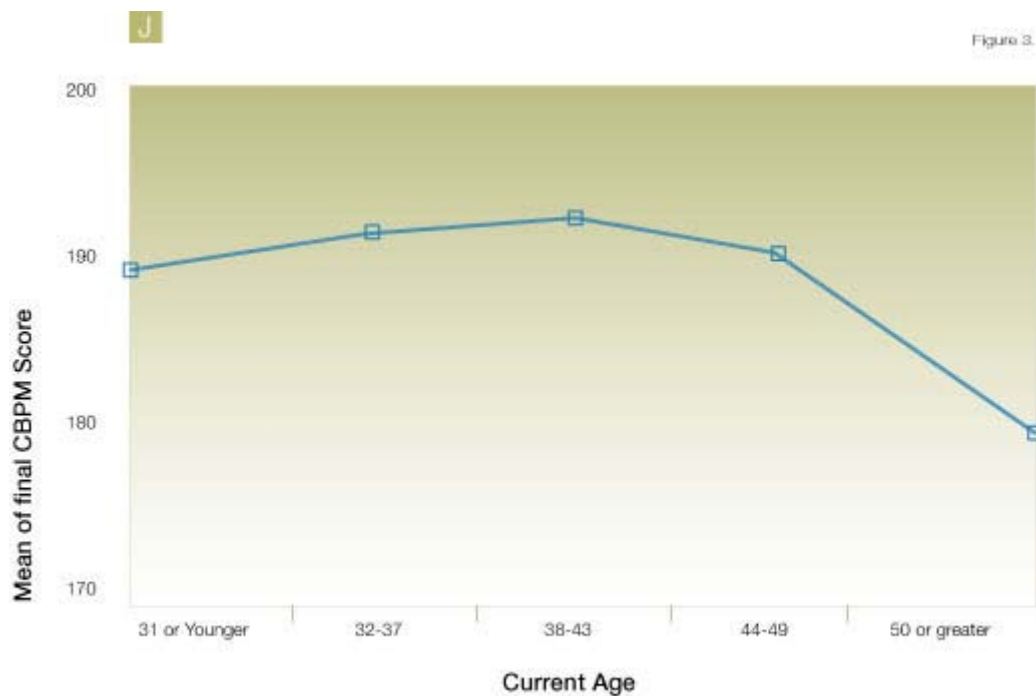


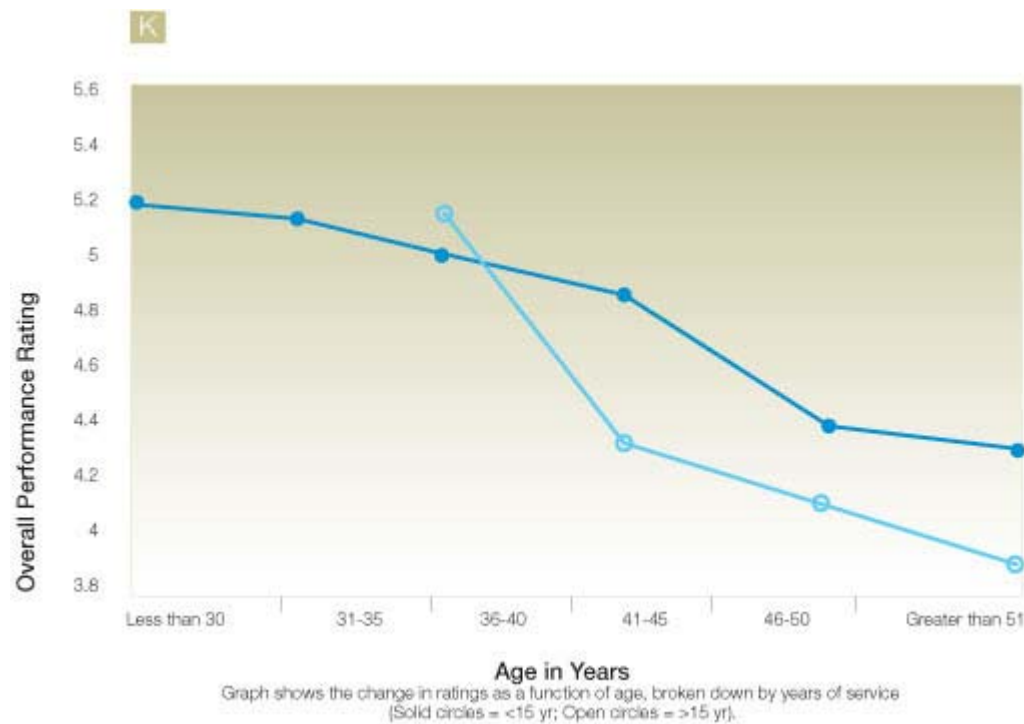
Figure 3. Mean CBPM Score for Current Age Group

The decline of performance among controllers age 50 and older is apparent in both tables of mean scores. While controllers age 44-49 performed about equally with controllers at

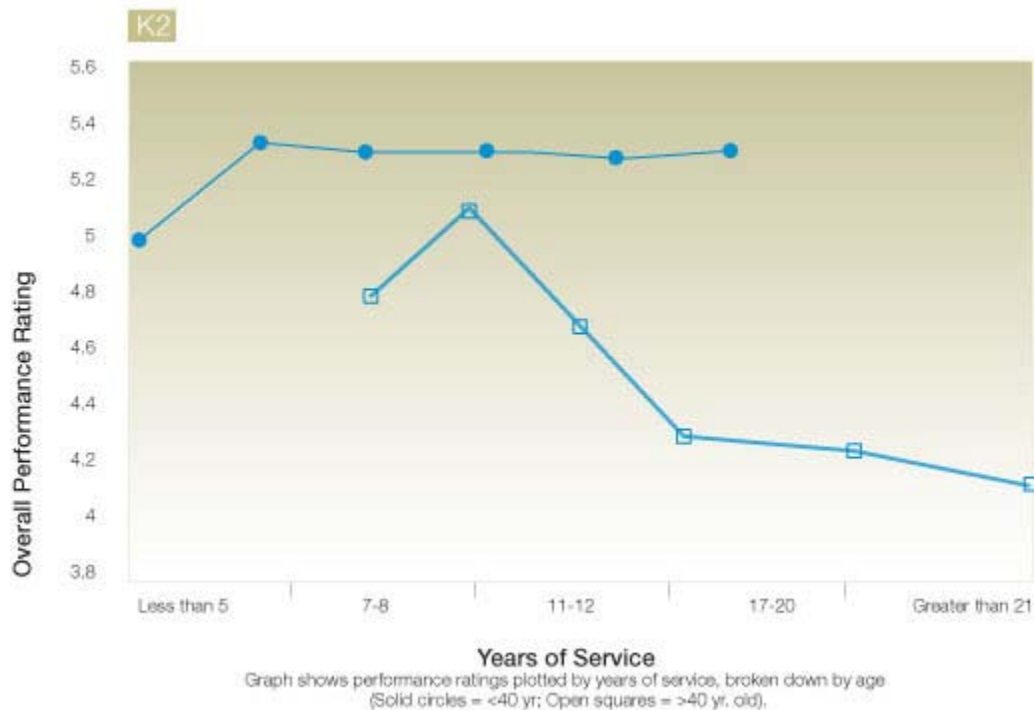
the beginning of their careers, controllers over 50 performed significantly worse than controllers at the beginning of their career.

Measuring controller performance away from their daily sectors, the FAA study verifies that a controller's job performance increases with age and experience until they reach their late 30s. While experience is beneficial in air traffic control, controllers over 50 exhibited performance levels lower than younger controllers, with significantly less job experience. Heil attributes the decline in job performance to an age-related decline in cognitive ability.

A 1998 study published by Becker and Milke in the *Aviation, Space, and Environmental Medicine* journal elaborates on the FAA study. Becker and Milke, working with data from FAA collection, show that controllers younger than 40 years old, with the most experience, rank highest on job performance. Older controllers, with 13 or fewer years of experience, had higher mean ratings than those with more job experience.



Becker and Milke concluded that while having experience in air traffic control appears to moderate the cognitive effects of aging, the benefits of experience cannot maintain job performance over the life span of a controller.



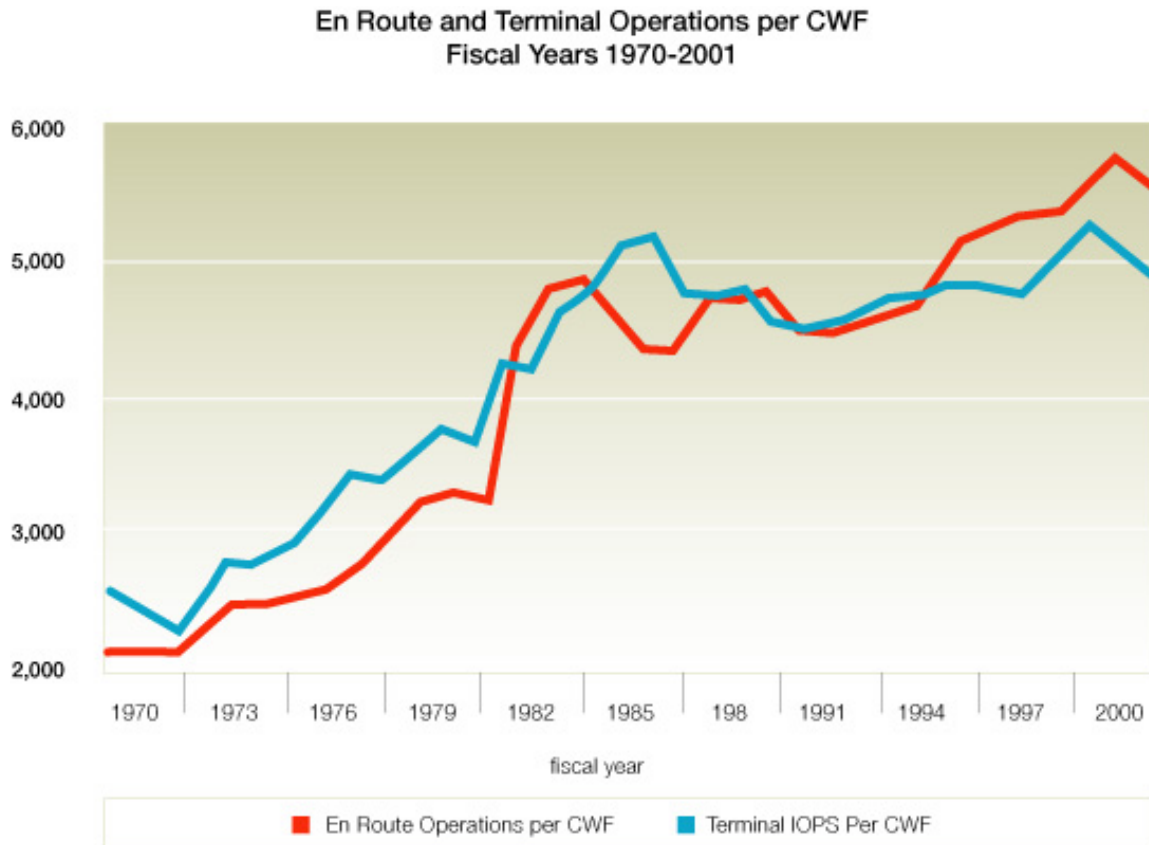
From the 1968 study to the FAA's most recent research in 1999, research reveals that compounding stress and aging factors create a decline in performance for controllers over the age of 45. The current mandatory retirement age of 56 recognizes this post age-45 decline and has proven both current and vital to the integrity of the air traffic control system.

### **Efficiency and Productivity**

Our current air traffic control system is the safest, most efficient system in the world because of highly trained, capable individuals. These same individuals, working in collaboration, also make our system the most efficient and productive in the world. According to a recent study by EUROCONTROL, American Air Traffic Controllers are 79 percent more productive than their European counterparts. Assuming that America's longer working hours make hour-for-hour costs comparable to those in Europe, support costs in our system are 57 percent lower than Europe's. U.S. controllers work longer hours, more days per month, and take fewer days off each year. They even have the capacity to work more airplanes at a time. What these figures mean is that the American air traffic control system is far more cost effective than its European counterpart; 74 percent more to be exact.

Since the original mandate set for retirement age in 1972, En route operations and terminal instrument operations, per controller workforce employee, have increased by 165 and 115

percent respectively. But, even as controller workloads skyrocket, American controllers maintain a gold standard for efficiency and productivity. Over the same time period, operational costs have increased by only 69 percent.



While the numbers above indicate the American controller is more efficient than ever, medical research indicates that extending retirement ages will damage the productivity of our system. Controller workloads can only be expected to continue in the years ahead, and without the appropriate workforce, we can expect a system that is less safe and more expensive. I think you'll agree our money is better spent insuring the future, than making up for the mistakes we could make today.



## **Conclusion**

Flight traffic this summer is expected to surpass pre-September 11<sup>th</sup> levels. Secretary of Transportation Mineta recently established the goal of increasing flight capacity threefold before the end of the decade. Mr. Chairman and members of the Committee, now is not the time to extend the retirement age. The safety of our flying public and the integrity of our entire system will depend on a new generation of capable controllers, not the ability to hold onto the ones we already have.

The FAA must begin hiring thousands of controllers to replace the thousands who are expected to retire in the years ahead. From clinical studies to cost analysis, evidence is clear that extending the retirement age is not a safe or effective solution. Numbers indicate that there are not enough older controllers to compensate for staffing shortages if you allow them to continue working. If there are not enough today, in a decade, our crisis may turn into a disaster.

We understand the temptation of keeping controllers beyond current retirement ages and have considered the option ourselves, but we decry this as a solution. While we admire the capable workforce that makes today's system a global standard of excellence, we must now make investments for tomorrow. The risks are simply too great.

The risks of stress levels, potential health problems, and declining cognitive abilities are the same today that lead Congress to set retirement mandates for controllers over 30 years ago. Air traffic projections and FAA goals, however, are more demanding than ever. Now is not the time to jeopardize the most productive, efficient system in the world with short-term, dangerous solutions.

Be assured that our controllers will do everything to uphold this gold standard, but aware that we face a staffing crisis that threatens the safety of the American skies. Our skies are only as safe as the number of capable eyes that are watching it, and right now, those eyes are dwindling.

Thank you for the opportunity to appear before this distinguished Committee. I look forward to answering any questions you may have.

### Source List

- Rose, R.M., Jenkins, C.D., and Hurst, M.W. *Air Traffic Controller Health Change Study*; Springfield, VA 1978
- Krantz, D.S. and Manuck, S.B. *Acute psychophysiological activity and risk of cardiovascular disease: A review and methodological critique*; Psychological Bulletin, 1984
- Suls, R.M. and Sanders, G. *Type A Behaviors as a General Risk Factor for Physical Disorder*; Journal of Behavioral Medicine, 1988
- Finkleman, J.M., and Kirschner, C. *An Information-Processing Interpretation of Air Traffic Control Stress*; Human Factors, 1980
- Dell'Erba, Gaetano MD, Venturi, Pierro MD, Rizzo, Fortunato MD, Porcu', Silvio MD and Pancheri, Paolo MD. *Burnout and Health Status in Air Traffic Controllers*; Aviation Space Environmental Med. 1994
- MacLennan, Richard N. and Peebles, Jason W.E. *Survey of Health Problems and Personality in Air Traffic Controllers*; Dept. of Psychology, University of Regina, Saskatchewan, 1996
- Becker, James T PhD and Milke, Ramon M. MEd. *Cognitive and Aging in a Complex Work Environment: Relationships with Performance among Air Traffic Control Specialists*; Aviation Space Environmental Med. 1998
- Heil, Michael C. *Air Traffic Control Specialist Age and Cognitive Test Performance*; Civil Aeromedical Aviation Administration, June 1999
- Heil, Michael C. *Air Traffic Control Specialist Age and Cognitive Test Performance*; Civil Aeromedical Aviation Administration, August 1999